

What is claimed is:

1. A wavelength converter, comprising:

a ring laser having at least an input facet and an output facet, said laser, when activated, producing an output beam having a wavelength  $\lambda_2$ , said output beam being switched off upon receipt of an input beam of wavelength  $\lambda_1$  at said inlet facet.

2. A method of converting an optical signal of a first wavelength to a corresponding optical signal of a second wavelength, comprising providing at least one ring laser having an input facet and an output facet;

providing at least one ring laser having an input facet and an output facet; activating said at least one ring laser, to produce an output optical signal having said second wavelength at said output facet; and modulating said output optical signal by supplying to said inlet facet an optical signal having said first wavelength.

2. The method of claim 2, wherein activating said at least one ring laser includes injecting an optical signal having said second wavelength at said inlet facet.

3. The method of claim 3, wherein modulating said output optical signal includes injecting into said at least one ring laser an optical signal having said first wavelength and having an intensity greater than the intensity of said signal at said second wavelength.

4. The method of claim 4, wherein modulating said output signal includes switching off said output signal in the presence of said modulating signal, and switching

on said output signal in the absence of said modulating signal to invert said modulating signal and to convert it to a different wavelength.

5. The method of claim 4, further including providing first and second ring lasers in cascade, wherein modulating said output signal includes switching off said output signal in the absence of said modulating signal and switching on said output signal in the presence of said input modulating signal to convert said input signal to a different wavelength.

6. The method of claim 4, wherein modulating said output optical signal includes injecting an optical data pulse stream into said at least one ring laser.

7. The method of claim 2, wherein activating said at least one ring laser includes injecting a variable optical signal having a selectable wavelength.

8. A wavelength converter, comprising:  
a ring laser having at least an input facet and an output facet;  
a first inlet modulating beam for injecting an optical signal having a first wavelength for propagation in said ring laser in a first direction; and  
a second inlet beam for injecting an activating optical signal having a second wavelength for propagation in said ring laser in a second direction to normally produce an outlet optical signal having said second wavelength, wherein said modulating beam has an intensity greater than said second beam, whereby the presence and absence of said modulating beam modulates said outlet optical signal.